Collaborative Analysts

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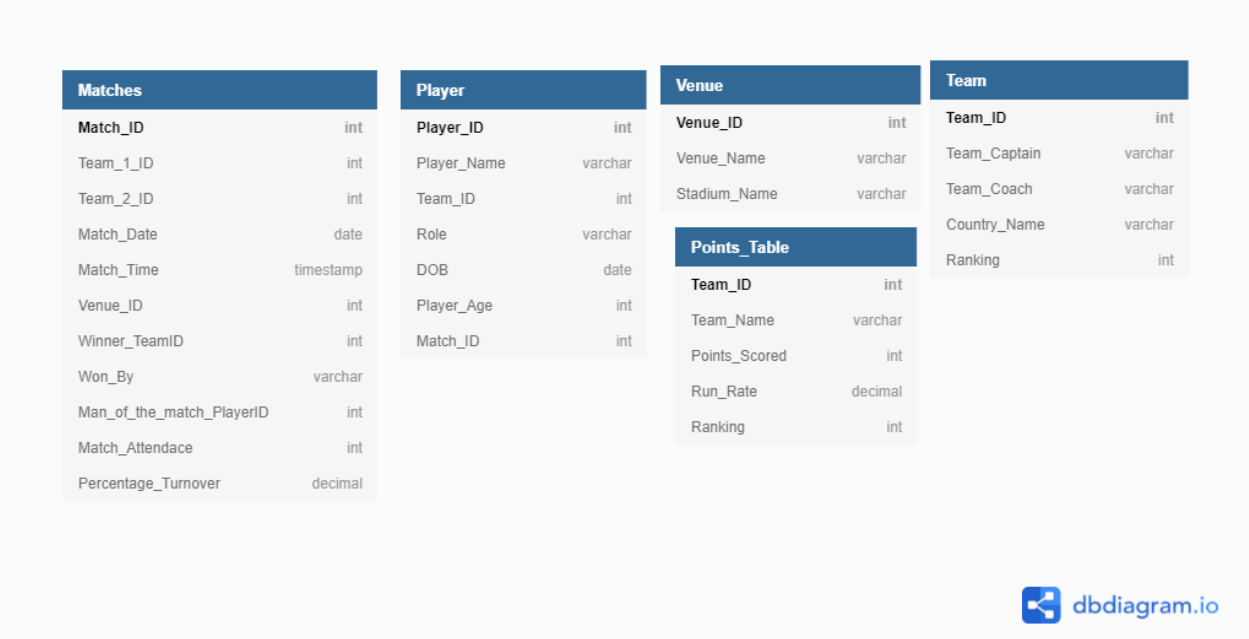
PART 1 : Mapping ER to Relational model

The steps followed for the same is as follows :

Mapping of Regular Entity Types:

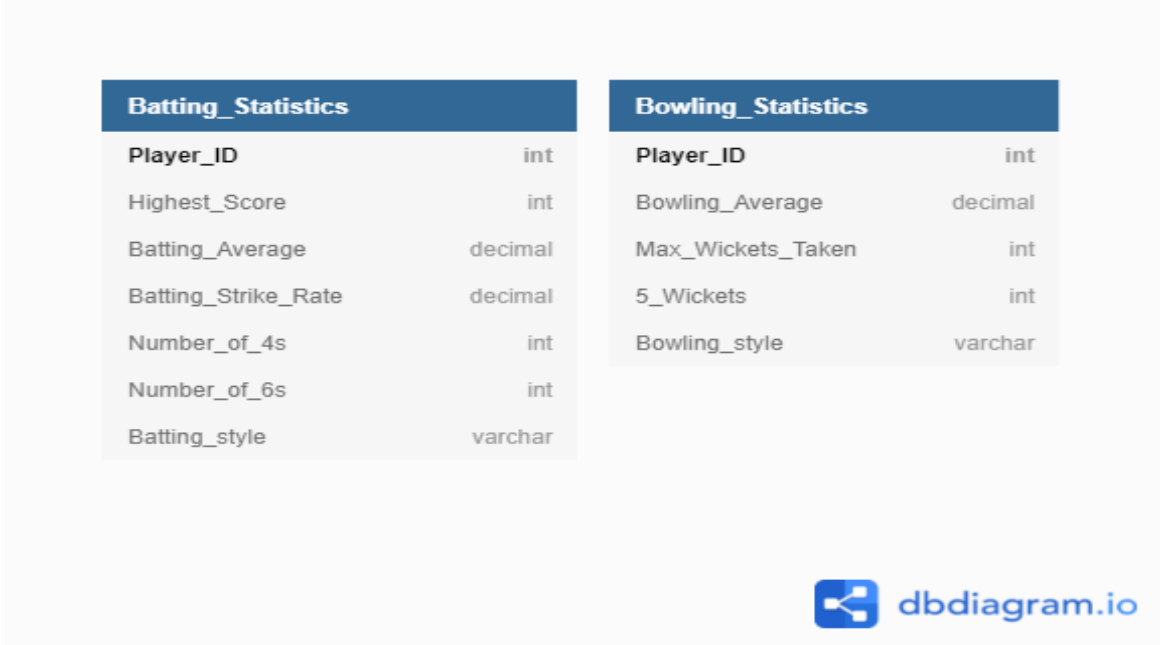
We have mapped all the regular entity types to relations by mapping with the corresponding primary keys.



Mapping of Weak Entity Types :

We tackled our two weak entities as follows :

1) For Batting Statistics , Player_ID is the foreign key linking the Player_ID with the batting statistics of that player.
2) For Bowling Statistics , Player_ID is again the foreign key linking the Player_ID with the bowling statistics of that player.



We added the foreign key in the Weak entity table to map them to our relational model .

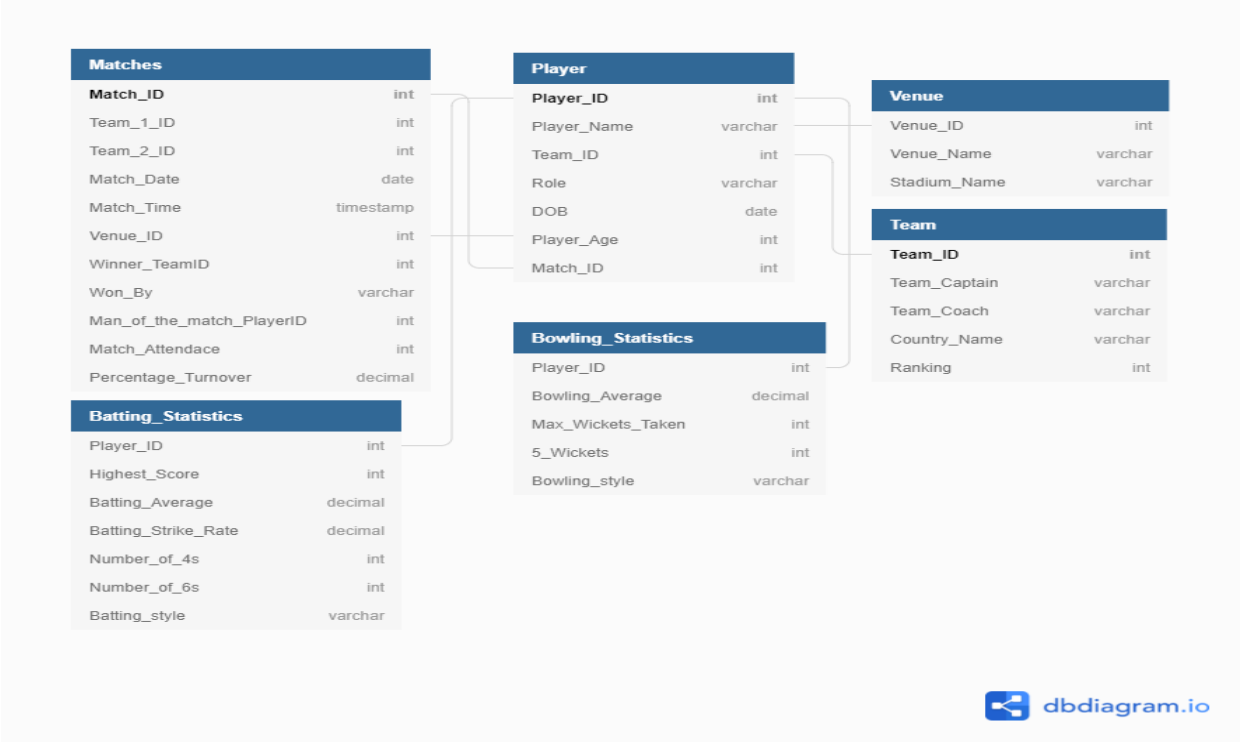
Mapping of Binary 1-1 Relationship Types:

Since our relational model does not contain any Binary 1-1 relations, this step can be skipped.

Mapping of binary N-1 Relationship types:

We have 3 binary N:1 relationship types

1) “Belongs To” relationship is between Player Table and Team Table , so we added the primary key of team Table (team_ID) as a foreign key in the Player Table.
2) “Plays” relationship is between Player Table and Matches table , so we added the primary key of Matches table (Match_ID) as a foreign key in the Matches Table.
3) “Is played at” relationship is between match and venue , so we added the primary key of venue Table (Venue_ID) as a foreign key in the matches table.

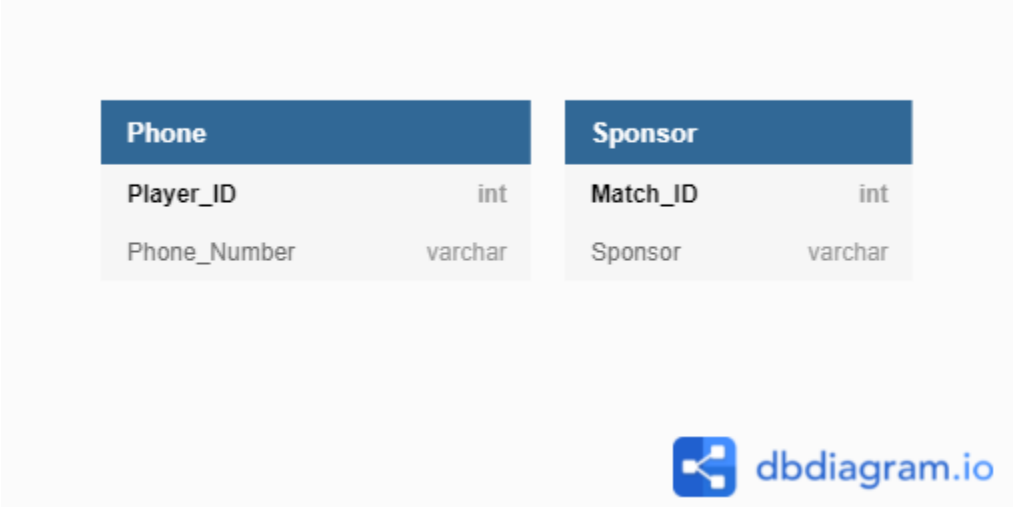


Mapping of binary N-N Relationship types:

Since our relational model does not contain any Binary N-N relations, this step can be skipped.

Mapping of multivalued attributes:

Phone in Player relation and Sponsor in Matches relation are multivalued attributes. We created a separate relation for each of them and included Player_ID as foreign key in Phone and Match_ID as foreign key in Sponsor.

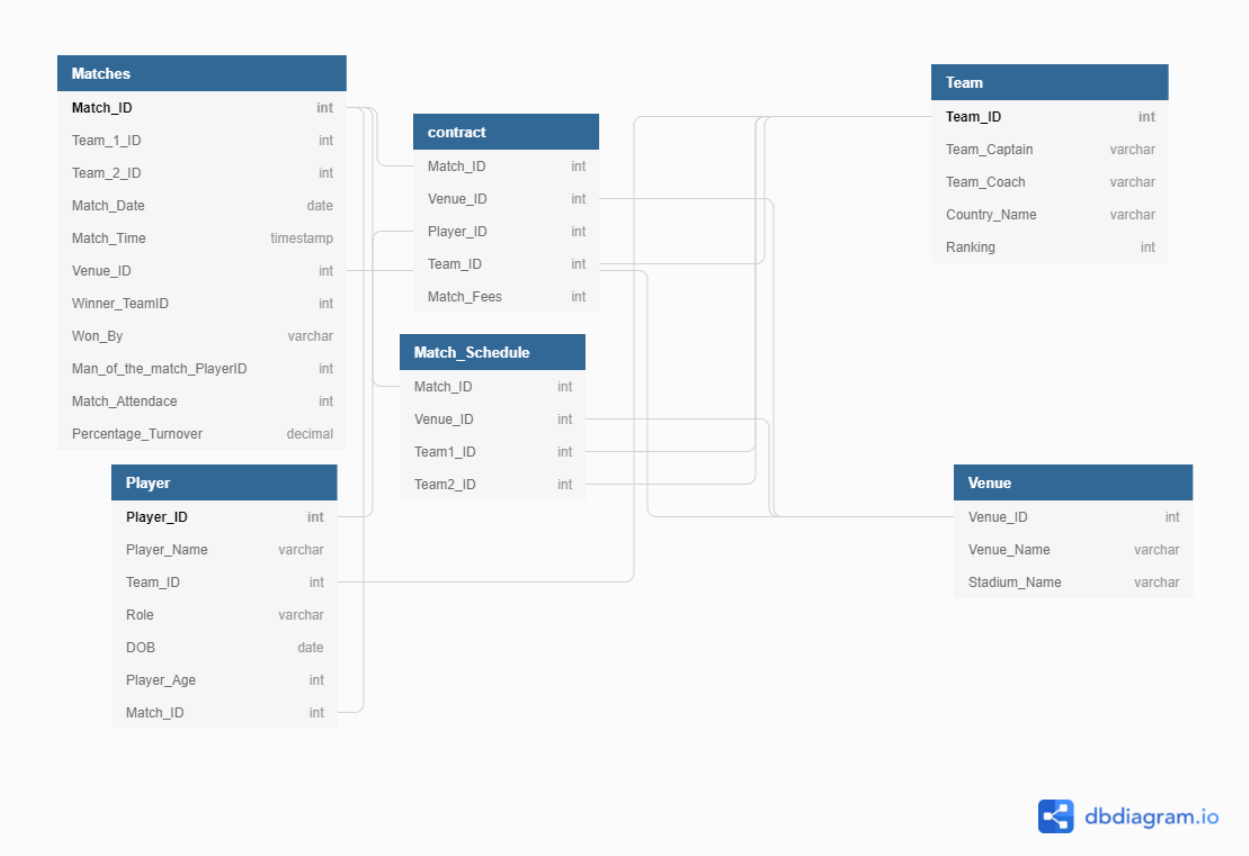


Mapping of N-ary relations :

We have 2 such relations in our relational model, They are contract and Match Schedule. We thus followed the Relationship Relation approach.

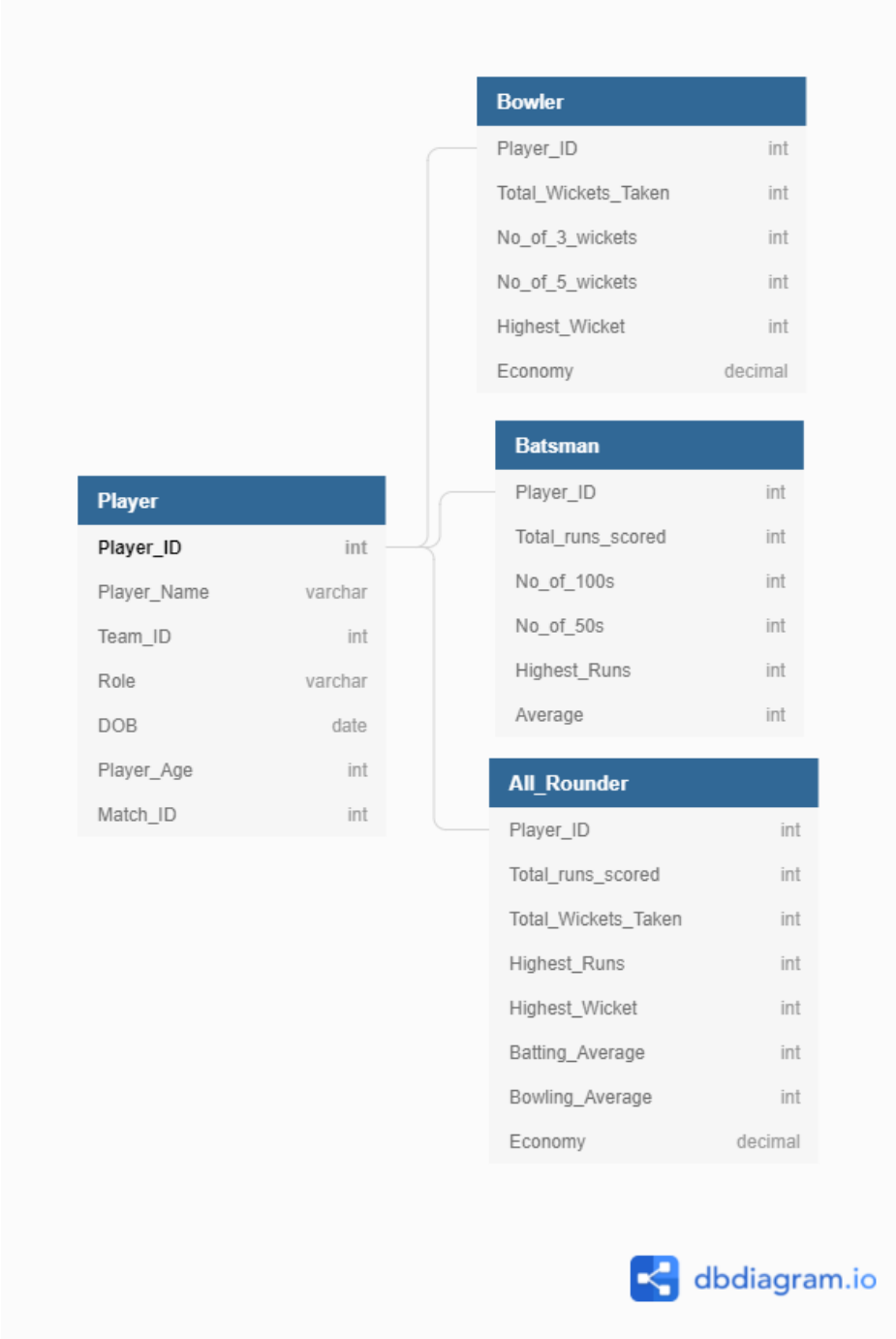
1. Contract :The Contract Relation is a degree 4 relation connecting Matches,Team,Venue and Player. We added the Matches_ID, Team_ID, Venue_ID, Player_ID, it is to be noted that Venue_ID has been replaced from the initial Venue_Name attribute as mentioned in the previous document and we also added an extra attribute for the Relationship called Match_Fees, The new relationship formed is always guaranteed to be unique.

2. Match Schedule : The Match Schedule Relation is degree 3 relation connecting Venue Match and Team, as there are 2 teams, we have taken 2 team IDs which are guaranteed to be different and we also added the Venue_ID (replaced from Venue _name) and Match_ID.



Mapping of Specialization:

Relation Players has 3 subclasses: Batsman, Bowler & All-Rounder. We create a relation for each of these three and include Player_ID as a primary key.



PART 2 : Conversion to 1 NF Form :

For a relational model to satisfy 1NF form the table :

1. it contains only atomic values.
2. An attribute of a table cannot hold multiple values..
3. First normal form does not allow multi-valued attributes, composite attributes, and their combinations.

Since our relational model already satisfies these criterions, it is already in 1NF form and thus no change is made.

PART 2 : Conversion to 2 NF Form :

For a relational model to satisfy 2 NF form the table:

1. The relational model must satisfy the 1NF form.
2. All the non primary attributes are only dependent on the primary key and not any composite candidate key of the table.

Since our relational model already satisfies these criterions, it is already in 1NF form and thus no change is made.

PART 2 : Conversion to 3 NF Form :

For a relational model to satisfy 3NF , it should satisfy the following characteristics:

1)It should be in 2NF.

2)Non prime attributes should only depend on the primary key and no other candidate key and there should be no transitive dependency.

Since our relational model already satisfies these criterions , it is already in 3 NF form and thus no change is made.

Final Relational Model: